ORDER

6470.36

OCEANIC DISPLAY AND PLANNING SYSTEM (ODAPS)

SYSTEM PROGRAM PLAN
and
SYSTEM IMPLEMENTATION PLAN

April 12, 1988

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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Initiated By: AAP-310

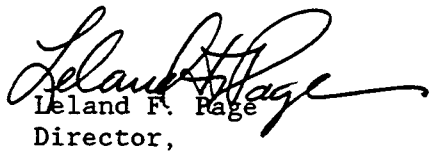
RECORD OF CHANGES

DIRECTIVE NO. 6470.36

CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE

FOREWORD

This order establishes the Project Implementation Plan (PIP) for the Oceanic Display and Planning System (ODAPS) as the primary directive governing activities required to implement ODAPS. It provides the direction to ensure that ODAPS progresses smoothly from the factory test phase into an operational system. It defines the role of the ODAPS Project Manager in directing system development, establishing milestones, preparing schedules, system testing, and field deployment, and it describes the supporting roles of other applicable organizations, both within and outside of, the Federal Aviation Administration (FAA).



Leland F. Page
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CHAPTER 1. GENERAL

1. PURPOSE. This order is the central reference document for activities required to implement the Oceanic Display and Planning System (ODAPS). It defines the activities necessary for the project to evolve from the factory testing phase into an operational system, and it provides a summary of the responsibilities of each project participant in relation to those activities. It presents project milestones, and establishes the schedule by which they will be accomplished.

2. DISTRIBUTION. This order is distributed to the division level within the Automation Service (AAP), Systems Engineering Service (AES), Systems Maintenance Service (ASM), Acquisition and Materiel Service (ALG), Air Traffic Operations Service (ATO), and Air Traffic Plans and Requirements Service (ATR) at Washington Headquarters; to the division level at the FAA Technical Center; to the division level at the Mike Monroney Aeronautical Center; to the Air Traffic and Airway Facilities Division level at the Eastern and Western-Pacific Regional Headquarters; and to Air Traffic and Airway Facilities offices at New York ARTCC, Oakland ARTCC, and Honolulu ARTCC.

3-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. Many modern advances in air traffic control have not been applied to the oceanic system, which does not have the radio and radar coverage of the continental system. Oceanic controllers are confronted with an increasing number of random flight tracks making it more difficult for them to effectively visualize the spatial relationship of their assigned aircraft from data presented on plotting boards and flight progress strips. Increasing numbers of high speed, high altitude jet aircraft, and the demand for the assignment of the most fuel efficient altitudes based on aircraft performance and current weather conditions have added to the already complex problem of managing air traffic over oceanic areas.

21. PURPOSE. The Oceanic Display and Planning System was conceived to apply modern technology to the oceanic air traffic control problem. The proposed system will assist controllers in assigning routes and altitudes more quickly and to better advantage, and will provide dedicated automated flight plan processing, enabling the controller to give the user a more rapid and more accurate determination of his eventual route assignment. It will provide automated assistance to the controller by presenting on a plan view display (PVD) the route structure of the assigned sector and the flight plan route of the assigned aircraft. It will also probe the system to determine whether a potential conflict exists between the flight plans of any aircraft assigned in the system. With these tools the controller should be able to rapidly determine whether or not a requested flight plan can be approved. He will be able to better visualize the flight geometry and assign the most efficient routes to his aircraft.

22. HISTORY. The project contract was awarded in October 1984. In July 1987, the final phase of the project was begun under a firm fixed price contract. The final phase consists of factory system testing, FAA user testing to be conducted in the factory, and site installation, checkout, and acceptance testing.

23-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION.

a. ODAPS will provide oceanic flight data processing, conflict probe, and visual display capabilities for New York and Oakland ARTCCs. It will perform flight data processing for all oceanic flights in the respective Center's area of responsibility, output flight strips to the appropriate sector positions, display aircraft reported or extrapolated positions, perform conflict probe computations, and output graphic and alphanumeric potential conflict data to ODAPS PVDs at oceanic sector positions. The ODAPS will exchange flight plan data with its colocated ARTCC and other ARTCCs that contain airspace that abuts the ODAPS airspace. ODAPS shall process flight plan data and related messages concurrently with stored adaptation data to produce outputs which shall be transmitted via Flight Data Input/Output (FDIO) remote control units (RCUs) to FDIO equipment located at oceanic sector positions in the Centers. The FDIO equipment shall use ODAPS data to print flight strips and other messages essential to oceanic air traffic control.

b. ODAPS is intended to serve until the Advanced Automation System (AAS) is implemented in the 1990s. It will use the NAS A4E0.0 software package modified to run on the IBM 4381 computer.

c. Revised oceanic control procedures will call for data to enter the ODAPS system either through manual keyboard entry from the FDIO equipment, from the PVD, from the Keyboard Video Display terminal (KVDT), or from other sources via communications interfaces. The central processor will then combine the input flight plan data with stored adaptation data as required to prepare flight progress strips and Full Data Blocks (FDBs) and direct the information to the appropriate controller positions in the Centers. This stored adaptation data will include message field data, geographic data, aircraft characteristics, and other data which is unique to a Center's area of responsibility.

d. Flight data processing begins with flight plan input. Error checking routines are performed on the flight plan, which is accepted if error-free. If errors are found, the source is notified by message. An accepted flight plan is processed according to the contents of the data fields. Direct route processing, route conversion, fix posting, calculation of arrival time, and strip addressing are performed by applying the stored data, logic, and rules to the flight plan contents. The resultant flight progress strips are addressed and transmitted to the Replacement Flight Strip Printers (RFSPs) at each control position responsible for a phase of that flight. These strips can be amended, updated, or removed by controller-entered messages.

e. The ODAPS operational scenario includes:

(1) Flight plan processing prior to activation.

(2) Transition into ODAPS oceanic control.

(3) Progress reporting.

(4) Conflict probe.

(5) Transition from ODAPS.

f. These activities are performed as each aircraft transits oceanic airspace and may be performed simultaneously for various aircraft; e.g., some flight plans may be undergoing processing prior to activation, other aircraft may be reporting fixes, while other flights are being probed for possible conflicts.

31. PHYSICAL DESCRIPTION.

a. Each center will have two systems; one in the active mode and the other in the standby mode. If problems develop with the active system, automatic switchover to the standby system will occur with no degradation of system performance.

b. Each system comprises four units grouped by hardware and function:

(1) Central Processor. The IBM 4381 computer handles the tasks of the Central Processing Unit (CPU).

(2) Communications Subsystems. All external communications are processed by redundant IBM 4956 70E Series/1 computers.

(3) Display Subsystems. Display data is processed by redundant IBM 4956 70E Series/1 processors and visually displayed to the controller on a Plan View Display (PVD) using an Interface Buffer Adapter Generator (IBAG) as the interface to the Display Processor. A Level Converter Unit (LCU) has been designed to enable the interface between the IBAG and the Series/1 Display Processor.

(4) Data input and output. Operational data input/output tasks are accomplished using FDIO equipment modified for use in the ODAPS suite.

c. The IBM 4381 processes the flight data using software functions derived from the NAS Stage A, Model 4, Series E, Version 0.0 (A4E0.0) software. These functions include most of the monitor and

support functions, certain functions to adapt the system to site specific requirements, and the conflict probe function.

d. The IBM Series/1 Communications and Display Subsystems serve as the conduit for all data entering and exiting the IBM 4381. This equipment controls the communications and display interfaces for ODAPS.

e. The FDIO equipment provides the means to enter and retrieve data. This equipment includes keyboards, cathode ray tube displays, flight strip printers, and remote data control units, and will be located within the Center near the oceanic controller positions.

f. The Plan View Display (PVD) will provide the controller with a visual representation of traffic as it transits his sector. Data transferred between the IBM Series/1 Display Processor and the PVD must be modified by the LCU and processed by the IBAG to ensure compatibility.

32. SYSTEM REQUIREMENTS

a. General. The ODAPS Project requires enough hardware and software to operate two separate oceanic control systems twenty-four hours a day. The requirement for continuous operation dictates a redundant system at both ODAPS sites.

b. Contractor-Off-the-Shelf Equipment location and quantity. Quantity includes site spares for non-IBM equipment.

TABLE 1.

Model number and description	Location/Quantity ZOA	ZNY
IBM Processors		
4381-P11 Central Processor Unit	2	2
IBM Series/1		
4956-E70 Series/1 Processor	4	4
4959-A00 S/1 I/O Expansion Unit	4	4
4975-02L S/1 Line Printer	4	4
3161-110 S/1 Display Station	4	4
IBM DASD		
3880-003 Storage Control Unit	2	2
3380-AE4 Direct Access Storage Device	1	1
3380-BD4 Direct Access Storage Device	1	1
3380-AA4 Direct Access Storage Device	1	1

IBM Miscellaneous		
3180-110 Display Station Standard	8	10
3268-C02 Color Printer	6	6
3274-D41 Terminal Control Unit	2	2
3278-A02 Display Console	3	3
3480-A22 Cartridge Tape Unit Controller	2	2
3480-B22 Cartridge Tape Unit	2	2
4245-012 Printer	2	2
4879 Alarm Panel	4	4
4993-001 Termination Enclosure	8	8
4997-02A Rack Enclosure	2	2
4997-02B Rack Enclosure	2	2
Modems		
GC-ME801 Short Haul, Black Box Corp.	2	2
2400M Datamodem, NEC Corp.	2	2
T-Bar Products		
5110 Transfer Switch	2	2
5285-1 Patch Panel	2	2
Black Box, Inc.		
GC-CM020 8K Memory Expansion	2	2
Airland		
SA-300 Protocol Converter Unit	9	13
Trutime		
60-DC WWVB Sync Digital Clock	3	3
A60-FS WWV Antenna	1	1

c. Government Furnished Equipment (GFE) location and quantity.

TABLE 2

Model number and description	Location/Quantity ZOA	ZNY
Interface Buffer Adapter Generators	2	2
FDIO Remote Control Units	3	2
FDIO CRTs	7	4
FDIO FSPs	7	4
FDIO Keyboards	7	4
PVDs	7	4

d. Newly developed hardware location and quantity. Quantity includes site spares. Life cycle spares are available from the FAA Depot.

TABLE 3

Model number and description	Location/Quantity ZOA	ZNY
Ino-Tech, Inc.		
Level Converter Unit	5	5

e. Software Requirements.

(1) NAS A4E0.0 baseline functions must be used to the maximum extent practicable.

(2) A Conflict Probe function must be developed.

(3) Visual display functions must be developed.

(4) An Adaptation function must exist to modify the software for site-specific requirements.

(5) All requirements of FAA-E-2713 must be satisfied.

f. Personnel Requirements. Initial estimates indicate that increases in personnel will be minimal. The same number of Controllers will be required, therefore Controller staffing will remain constant. Similarities between Host and ODAPS will allow the same System Operators to work both systems simultaneously with minimal increase, approximately one per shift, in System Operator staffing. Commercial hardware will be contractor maintained; therefore, no increase in maintenance personnel for commercial off-the-shelf (COTS) hardware is expected. The increase in GFE per site is not expected to create a need to increase maintenance staffing.

33. INTERFACES. To provide ODAPS with the necessary flight plans and other data, interfaces are required with external systems. Each ODAPS interface is described in its respective ODAPS Interface Control Document. The contractor will install the interfaces between ODAPS and the systems or facilities listed below.

a. Aeronautical Radio, Inc. (ARINC) (through the NADIN IA concentrator).

b. Aeronautical Fixed Telecommunications Network (AFTN) (through the NADIN IA concentrator).

c. North American Aerospace Defense Command (NORAD)

d. Service A and Service B networks (through the NADIN IA concentrator).

e. National Airspace Data Interchange Network (NADIN)

f. Flight Data Input/Output (FDIO)

g. Central Flow Automation Facility (CFAF)

h. Interfacility messages with up to six ARTCCs

i. Interface Buffer Adapter Generator (IBAG) (for output to the PVDs.

34-39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. 37 milestones depicting significant project activities are listed, along with their completion status, in Appendix 2. Other activities which must be completed to support these milestones are shown in the ODAPS Precedence Network.

41. MILESTONE SCHEDULE SUMMARY. The milestones have been analyzed, assigned specific durations, and plotted as a function of time to develop a project schedule. This schedule of events for the ODAPS program is shown as a bar chart in Appendix 3. This bar chart is updated each month and presented to the Program Status Review Board (PSRB).

42. INTERDEPENDENCIES AND SEQUENCE. Interrelationships between activities, task durations, dependencies, and constraints are depicted in the ODAPS ARTEMIS Network, which is maintained by the SEIC for AAP-310 at the Washington, D.C. SEIC Planning Office. A copy of the network is available from the SEIC Planning Office at each Regional Headquarters. The network will be revised as necessary during the life of the project. Changes will be reflected on the Master Schedule PSRB chart, and the updated copy will be transmitted to the SEIC Regional Planning Office.

43-49. RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT. The overall technical management of the ODAPS program is the responsibility of the Air Traffic Control Automation Division, AAP-300 and, in particular, the En Route Automation Program Office, AAP-310. A member of this organization is designated ODAPS Project Manager and is the single focal point for all project activities.

a. The Project Manager, ODAPS, is assigned the following responsibilities:

(1) Coordinate ODAPS activities.

(2) Prepare the Project Implementation Plan.

(3) Build the precedence network.

(4) Develop the project schedule.

(5) Participate in contract negotiations.

(6) Ensure availability of funds.

(7) Interpret the Statement of Work.

(8) Secure support services and resource commitments.

(9) Coordinate all project interfaces.

(10) Provide a central point of contact for all participants.

b. A Contracting Officer (CO), designated by ALG-320, performs general contract management to assure that the terms of the contract are met. The CO is the only person authorized to make changes that will affect prices, deliverables, or schedules.

c. A Quality/Reliability Officer (QRO), designated by ALG-400, is the FAA's representative at the contractor's facility. The QRO's functions are governed by FAA Quality Assurance policies and procedures, and by the terms and conditions of the contract.

d. The Technical Officer position will be filled by AAP-310 Project Manager (PM) and will provide technical guidance and direction to the contractor. The PM will ensure that the contractor has access to technical documentation, appropriate data bases, and sources of information relative to Government Furnished Equipment (GFE).

e. Regional Project Manager. The Western-Pacific Region (AWP) and the Eastern Region (AEA) will each appoint an ODAPS Regional Project Manager. The Regional Project Manager will ensure that facilities and engineering work is complete prior to delivery of the ODAPS equipment, monitor ODAPS equipment installation, and coordinate requests for contractual or technical support with AAP-310 and the National Automation Engineering Field Support Sector, ASM-160. The Regional Project Manager will arrange for appointment of a technical representative at Oakland ARTCC or New York ARTCC as appropriate.

f. ARTCC Technical Representative. An ARTCC Technical Representative (TR), appointed by each Region, will have overall responsibility for the management of the ODAPS Project within the ARTCC. The duties of the TR may be divided between the Air Traffic (AT) and Airways Facilities (AF) services. The AT TR shall be the AT AMA designated during HOST implementation. The AF TR shall be the AF AMTSO designated during HOST implementation. The TR shall be responsible for ensuring that the ODAPS site preparation activities are complete and acceptable before the ODAPS equipment arrives. The TR shall be responsible for assisting the Contractor in installing the system, reporting problems encountered during installation, and resolving problems with the help of AEA/AWP, AAP-310, and ASM-160, if required. The TR must ensure that all ODAPS hardware has been properly installed, that all installation, integration, and acceptance testing has been completed, and that Initial Operational Capability (IOC) has been reached. The TR must also ensure that controllers and systems operators are trained, and that operational procedures have been established prior to the Operational Readiness Demonstration (ORD).

g. FAATC Project Management. ACT-100 will review and comment on FAT plans and procedures, witness FAT, and prepare test plans and procedures for user acceptance testing (UAT). An ODAPS Test Representative will be appointed from ACT-100 to serve as the lead for UAT. The Test Representative will coordinate his activities with the ODAPS Project Manager, AAP-310.

h. Systems Engineering and Integration Contractor (SEIC) Project Management. The SEIC provides the AAP-310 Project Manager with project management assistance in the following tasks:

(1) Project Planning.

(2) Acquisition package preparation.

(3) Technical proposal evaluation.

(4) Subsystem and interface configuration control.

(5) Project financial management and control.

(6) Project schedule control.

(7) Documentation control.

(8) Logistics support analysis.

(9) Project reviews and reports.

i. The contractor, ST Systems Corporation (STX), will perform duties in accordance with the ODAPS contract, number DTFA01-85-Y-01002.

j. The user of this document is responsible for bringing to the attention of the ODAPS Project Manager any significant discrepancy found within this document.

51. PROJECT CONTACTS. The individuals who are directly involved with, and who are responsible for the successful completion of the ODAPS project are listed in Appendix 1 to this document.

52. PROJECT COORDINATION. The following projects are interrelated with the ODAPS project. Communication should be maintained with the appropriate project managers.

a. Flight Data Input/Output(FDIO). Data entry and exit for ODAPS will be provided by the equipment developed under the FDIO project and modified for use in the ODAPS suite.

b. National Airspace Data Interchange Network (NADIN). ODAPS will interface with the NADIN network for exchange of data with other participants.

c. Host Computer System (HOST). NAS A3d2.14 Software has been re-hosted to operate on the IBM 3083 computer under the HOST Project. After the HOST Monitor was successfully run it was re-hosted on the IBM 4381 to become the ODAPS Monitor. The ODAPS monitor will be independent of the HOST Project.

53. PROJECT MANAGERIAL COMMUNICATIONS.

a. Communication between the AAP-310 Project Office, the Regions, ARTCCs, and FAATC may be maintained using the SEIC "PROFS" system.

b. The contractor presents monthly project status reviews under direction of the AAP-310 ODAPS Project Manager.

54-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. Approximately $37.2M have been allocated to FAA Headquarters for the ODAPS project. From these funds a phased contract, DTFA01-85-Y-01002, was awarded in October 1984 to SASC Technologies, Inc. (currently known as ST Systems Corporation, (STX)). Phase I and Phase IIA were Cost Plus Fixed Fee; Phase IIB is Firm Fixed Price. Monthly Program Status Review Board (PSRB) reports include an updated financial summary.

61-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. DEPLOYMENT OVERVIEW.

a. The contractor will install the ODAPS system at two FAA sites. The FAA will prepare the floor space for the entire system, and will install the IBAG, FDIO, and PVD equipment. The FAA will provide power to the power panel in the computer room. The contractor is responsible for connecting contractor-installed equipment to the power panel. The Contractor is responsible for providing and installing all inter- and intra-system cabling at the facilities.

b. The contractor is responsible for system maintenance and operation at each site until successful completion of the Site Acceptance Test at that site. Until that time, the contractor has exclusive access to the ODAPS equipment.

71. INSTALLATION PLAN. Installation Plans have been developed by the contractor and approved by AAP-310. There is a dedicated plan for each site. The plans contain:

(1) Site information affecting installation.

(2) Installation drawings.

(3) Electrical and environmental interface definitions.

(4) Installation procedures.

(5) Installation checkout procedures.

(6) Identification of responsibilities and authority of personnel necessary to effect the installation.

(7) Identification of all hardware, software, tools, and other materials required.

(9) A schedule of events and manpower estimates for the installation.

72-79. RESERVED.

CHAPTER 8. VERIFICATION

80. TEST OVERVIEW. Formal ODAPS testing is grouped into four phases. Each test phase will be conducted in accordance with its applicable test plan.

a. Factory Acceptance Testing. Factory Acceptance Testing (FAT) is conducted by the contractor at his system development site.

b. User Acceptance Testing. User Acceptance Testing (UAT) is an FAA-designed and conducted test to be performed at the contractor's site.

c. Site Acceptance Testing. Site Acceptance Testing (SAT) is conducted by the contractor at each field site. Successful SAT completion ends the contractor's contractual system development obligation at that site and marks Initial Operational Capability (IOC).

d. Operational Readiness Demonstration. Operational Readiness Demonstration (ORD) is an FAA activity at each site. When ORD is complete the system will be ready for commissioning.

81. FACTORY ACCEPTANCE TESTING.

a. Purpose. Factory Acceptance Testing (FAT) is conducted to verify that the operational requirements of the ODAPS specification have been met.

b. Reports. Factory Acceptance Test results will be documented in test reports produced by the contractor. The reports are due 30 days after test completion.

c. Reviews. Test results will be reviewed and approved by FAA test participants to verify that the test requirements have been met.

d. Test Completion. AAP-310 will pronounce the FAT complete following successful test execution and resolution of all critical and high priority PTRs written during FAT.

82. USER ACCEPTANCE TESTING. User Acceptance Testing (UAT) will be conducted by the FAA at the contractor's site. The contractor will support the test by providing facilities and system operations staff.

b. User Acceptance Test (UAT) Objectives. The User Acceptance Test is composed of three major test areas, each with specific objectives.

(1) Interface Tests. Validate specification FAA-E-2713 requirements for data and control paths between ODAPS and other systems and facilities.

(2) Site Systems Generation. Build two operational software systems (assemble, compile, edit, etc.) using adaptation parameters for New York Center and Oakland Center. Operate the system to verify the performance of the software builds.

(3) Operational Tests. Duplicate as closely as possible the actual ODAPS ATC activities at New York and Oakland to verify system stability prior to shakedown tests and deployment to the field.

83. SITE ACCEPTANCE TESTING.

a. This phase of testing verifies that ODAPS fulfills the requirements of the contract and system specifications. These tests will be performed in the field on a modified version of the Composite Oceanic Data Set (CODS) in accordance with approved Site Acceptance Test Plans and Test Procedures.

b. During Site Acceptance Testing the Contractor is responsible for maintenance of software and non-GFE hardware.

c. The contractor will prepare the Site Acceptance Test Plan and Test Procedures (as change pages to the Factory Acceptance Test Plan and test Procedures, when possible) and submit them to AAP-310 for review. When the tests are concluded, hardware and software subsystems will have been successfully merged and specified requirements will have been met. This time is designated IOC.

c. Site Acceptance Test Objectives.

(1) Demonstrate, through system checkout up to Initial Operating Capability (IOC), that system installation has been successful and complies with specifications.

(2) Demonstrate that support items, such as logistics and support equipment, manuals, and other documents are technically compatible and in accordance with specifications.

84. OPERATIONAL READINESS DEMONSTRATION. The ORD is a formal demonstration that ODAPS is ready to perform real-time air traffic control tasks. It demonstrates the readiness of personnel, procedures, hardware, software, and support services to support these tasks as applicable. The measurement criteria for this demonstration are established by Air Traffic Services, Airways Facilities, and Development

and Logistics. The ORD examines the following operational, maintenance, and engineering areas:

a. Final refinement of operating procedures, methods, adaptation, and parameters.

b. Demonstration of adequacy of all aspects that involve actual control of air traffic prior to commissioning.

c. Verification that system, subsystem, and equipment documentation is accurate at the time the facility becomes operational.

d. Verification that sufficient staffing exists and that personnel are sufficiently trained and familiar with system functions and equipment.

e. Verification that the required facility logistic support capability has been established and that technical logistics data is available.

85-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT. ODAPS Maintenance is based on the Maintenance Concept defined in detail in the Maintenance Plan provided as Appendix D of the ODAPS ILSP. Details of contracted maintenance support can be found in the ODAPS Maintenance Statement of Work which is undergoing final drafting as of this writing.

a. Government Furnished Equipment (GFE). GFE will be maintained by the FAA under its existing support system.

b. Commercial-Off-The-Shelf equipment (COTS). COTS, including software, will be maintained under a separate maintenance and support contract.

(1) Most of the ODAPS COTS hardware is made by IBM. Headquarters (AAP-310) will contract for the first year of maintenance. Options for follow-on years shall be funded and contracted for by ASM-200, and technically administered by the regions.

(2) Non-IBM equipment will be removed by AF Technicians and replaced with site spares. Failed units will be shipped to the FAA Depot for repair or disposal as determined by Depot personnel.

c. Newly developed equipment. Equipment that has been developed specifically for ODAPS has been subjected to reliability and sparing quantification analysis. A life cycle spares buy for Depot inventory will be executed based on the results of the analysis. Site spares are being purchased under the ODAPS contract to support operations until the life-cycle spares buy is completed.

d. Site Maintenance and Repair. The airway facilities staff of the ARTCC shall monitor ODAPS system operation. When a system failure is detected, airway facilities will either attempt a restart or switch over to the backup ODAPS system. Once a failed system is off-line, airway facilities will isolate the problem to the subsystem level. Failure of an IBM supplied subsystem will be resolved by requesting IBM on-site maintenance. Repairs of all other ODAPS hardware will consist of component replacement or subsystem replacement where appropriate. When the maintenance is completed, the airways facilities staff will run diagnostics to verify successful repair.

e. Site Spares. Spares for IBM supplied equipment will be furnished by IBM. Spares for all other equipment will be stored at the ARTCC. Replacements for non IBM spares will be obtained from the FAA depot.

f. Regional Support. System failures which cannot be resolved by the ARTCC will be referred to the regional office for resolution. AWP-400 shall be designated lead region for hardware support and shall be responsible for engineering hardware improvements and providing on-site problem resolution assistance if required by Oakland or New York. HDRs

generated during the life of the program will be forwarded through the parent region to AWP-400 for resolution. Regions shall technically supervise performance of the hardware maintenance contract. National funding and contract management will be provided by ASM-100 for ODAPS IBM maintenance through the life of the program. The FAA depot shall be responsible for repair and replacement support for all non-IBM ODAPS equipment including ODAPS consumables.

g. Software Maintenance. Since no ODAPS suite is available to ATR-200 at the FAATC, software maintenance support will have to be provided through other sources. To ensure that adequate support is available to maintain the operational system, software maintenance shall be conducted in accordance with a Memorandum of Understanding (MOU) that as of this writing is being formulated by ATR-1, AAP-1, ASM-1, AEA-1, and AWP-1. When mutual agreement is reached on its content, the MOU will be the framework upon which system maintenance and enhancement responsibilities are assigned.

(1) Site Maintenance. Site Air Traffic staff to include Supplemental Software Support (SSS) personnel will maintain the ODAPS system. Training will be provided under a separate training contract. Maintenance shall include providing adaptation changes, map updates, and performing testing of any new software release or patches. In addition the site staff shall document software problems via the Program Trouble Report (PTR) form in order to keep the ODAPS system operational. PTRs shall be sent to ATR-200 for resolution and a copy to the parent region. A separate sole source contract shall be let to STX to provide software maintenance support normally received from ATR-200 and support software maintenance normally received from ASM-100 to cover software maintenance tasks.

(2) Program Trouble Report Handling. ATR-200 shall screen PTRs for validity and assign them to either the support contractor (STX) or a facility staff for further analysis, if necessary, and resolution. PTR resolution shall be verified by a facility staff and the results reported to ATR-200. ATR-200 will then decide to implement immediately as a patch at Oakland and New York or place the resolution in the next ODAPS system release.

(3) New Software Releases. ATR-200 shall define system content for new ODAPS software releases. These packages will be approved by the AAT Configuration Control Board. ATR-200 will manage the packaging and scheduling of system software releases prepared by the STX contractor.

(4) National Support Contract. The contract for national software support will be set up by AAP-300. ATR-1 will budget for commercial software licensing and support. Management and funding for software support portion of the contract will be assumed by ASM-230 within one year after final ODAPS site reaches IOC. The support contractor will perform his work using the remote job entry capabilities of the off-line Oakland ODAPS system. The support contractor shall have at least one person at Oakland to schedule and monitor the remote job entry development work. The following specific services and tasks shall be performed by this contractor:

(a) The contractor will perform PTR resolution, ODAPS system builds and on-site support as required.

(b) The contractor will perform ODAPS enhancements development. These enhancements will be funded with RE&D and F&E appropriations.

(c) The contractor will provide support for ODAPS refresher training using training materials developed and applied under the ODAPS training contract.

(d) The contractor will maintain, update, publish and distribute system documentation including CPFSs, CPDSs, SDDs, ICDs, and assorted system maintenance and operation manuals delivered under the ODAPS contract.

91. TRAINING.

a. A sole source training procurement is being exercised with STX for ODAPS training materials and classroom presentation.

b. Training program development will be completed in time for training to support ORD at ZOA and ZNY.

c. The ODAPS Subsystem Training Plan requires the following training. Specific training to be conducted under each category will be established by the training contractor during Job Task Analysis following contract award. Training for AF Technicians was specifically excluded from the ODAPS Subsystem Training Plan because the only new equipment requiring AF support is the Level Converter Unit (LCU - newly developed for ODAPS) and the Protocol Converter Unit (PCU - modified for ODAPS). The LCU and PCU are "remove and replace" items. The ODAPS Maintenance Manual and System Engineer course materials will provide sufficient information to enable an AF Technician to identify and replace a failed LCU or PCU.

(1) AT Controller. The Oceanic Controller will require training emphasizing an overview of the ODAPS operation and its integration into present control procedures, ODAPS Display operation, ODAPS operational interfaces, and Conflict Probe.

(2) System Engineer. The System Engineer will require training emphasizing system diagnostics and error analysis.

(3) Computer Operator. The Computer Operator will require procedural training on ODAPS computer operations and the differences between ODAPS and HOST systems and procedures.

(4) Software Maintenance Specialist/Automation Specialist. The Automation Specialist must be trained in the theory and structure of the software program.

92. SUPPORT TOOLS AND TEST EQUIPMENT.

a. ODAPS requires no hardware test tools and equipment not already available at the sites.

b. ODAPS software support programs are part of the deliverable software system.

93. VENDOR DATA AND TECHNICAL MANUALS. The contractor is providing the following support documentation.

a. Operator's Manual. The Operator's Manual will provide the information necessary to enable an operator to perform system start-up, start over, switch over, run and shutdown operations.

b. Support Software User's Manual. The User's Manual will provide the information needed to enable the user to control the operational and operational support programs.

c. System Maintenance Manual. The System Maintenance Manual will provide the information necessary for maintenance of the contractor supplied portion of ODAPS. The manual will be in a Contractor specified format consistent with the requirements of FAA Order 6000.27 and 6000.15A.

d. Spare Parts List. The Spare Parts List will be a complete list of recommended spare parts, including all components and hardware.

94-99. RESERVED.

CHAPTER 10. ADDITIONAL PROJECT IMPLEMENTATION ASPECTS

100. TRANSITION.

a. A transition plan is necessary to document procedures for phasing out current oceanic control operations and initiating full-time ODAPS operations. The regions will prepare a transition plan to describe a systematic method to accomplish this conversion. The transition plan should address the following:

1. Procedural changes (if necessary) to the present system while the new system is being tested.

2. Personnel staffing requirements for transition.

3. Facility modifications, if required, due to transition activities.

4. Communication system modifications required by dual operations.

5. Schedule of transition activities (ARTEMIS network).

6. Responsibilities of participating organizations.

101. CONFIGURATION MANAGEMENT.

a. STX will support a configuration audit and other product assessment activities of the ODAPS program in accordance with the contract. AAP-310 and the resident FAA QRO will direct the audit.

b. The ODAPS product baseline will be defined by AAP-310 after the completion of the Physical Configuration Audit (PCA) by the FAA QRO. This baseline will include coordinated inputs from ACT-100, AMS-160, ATR-100, ATR-200, AWP and AEA as a minimum.

c. Configuration Management Policy and Procedures.

(1) Software.

(a) AAP-310 will maintain configuration management responsibility for ODAPS software until turnover to ATR-200 after completion of site acceptance testing at both sites, and after system acceptance by ATR-200. The AAP-300 cluster Configuration Control Board will approve the baseline prior to turnover.

(b) ATR-200 will maintain configuration management responsibility for ODAPS software subsequent to Site Acceptance Testing.

(c) STX will be responsible for documenting software malfunctions until completion of site acceptance testing. Malfunctions will be documented with FAA Program Trouble Report (PTR) forms.

(d) Facility AT staffs will assume normal reporting responsibility for software discrepancies following system acceptance. PTRs will be forwarded to ATR-200 and a copy sent to the parent region.

(e) Validation and prioritization for resolution will be determined by ATR-200.

(2) Hardware.

(a) AAP-310 will maintain configuration management responsibility for ODAPS hardware until turnover to AWP-400 after completion of site acceptance testing at both sites.

(b) AWP-400 will maintain functional control of configuration management for ODAPS hardware subsequent to Site Acceptance Testing.

(c) STX will be responsible for documenting and resolving hardware malfunctions until completion of site acceptance testing. Malfunctions will be documented with FAA Hardware Discrepancy Report (HDR) forms.

(d) Facility AF staffs will assume normal reporting responsibility for software discrepancies following system acceptance. HDRs will be processed through parent regions and forwarded to AWP-400 for action.

(e) AWP-400 will perform pre screening of ODAPS HDRs submitted by Oakland and New York. Priority for resolution will be assigned by AWP-400. Disagreements between regions concerning HDR pre-screening shall be referred to ASM-100.

(3) Documentation. Configuration management of ODAPS documentation will be the responsibility of AES-410 for those documents listed in NAS-MD-001. All other software documentation for the sites will be managed by ATR-200 and hardware documentation will be managed by AWP-400. STX support contractor will be tasked to maintain currency of documentation as well as prepare and distribute changes necessitated by system maintenance. Documentation control procedures in use by FAATC ICB should be used as a guide. Drawings and other hardware reprocurement documentation will be maintained by AAC-400.

(4) Changes. Requests for changes and enhancements to ODAPS will be submitted using NAS change proposal (NCP) procedures. NCPs can be submitted by any concerned agency. Each region will pre-screen the NCP from its ODAPS facility. NCPs passing the pre-screening shall be forwarded to AES-410 for headquarters processing by appropriate headquarters Configuration Control Boards.

102. ACRONYMS

ARTCC	Air Route Traffic Control Center
CFAF	Central Flow Automation Facility
CODS	Composite Oceanic Data Set
COTS	Commercial Off-the-Shelf
F&E	Facilities & Equipment
FAATC	Federal Aviation Administration Technical Center
FAT	Factory Acceptance Test(ing)
FDIO	Flight Data Input Output
GFE	Government Furnished Equipment
HDR	Hardware Discrepancy Report
IBAG	Interface Buffer Adapter Generator
ILSP	Integrated Logistics Support Plan
IOC	Initial Operational Capability
LCU	Level Converter Unit
MOU	Memorandum of Understanding
NADIN	National Airspace Data Interchange Network
NCP	NAS Change Proposal
NORAD	North American Air Defense Command
ODAPS	Oceanic Display and Planning System
ORD	Operational Readiness Demonstration
PCA	Physical Configuration Audit
PCU	Protocol Converter Unit
PIP	Project Implementation Plan
PTR	Program Trouble Report
PVD	Plan View Display
QRO	Quality/Reliability Officer
RCU	Remote Control Unit
RE&D	Research, Engineering & Development
SAT	Site Acceptance Test(ing)
SEIC	Systems Engineering and Integration Contractor
UAT	User Acceptance Test(ing)
ZNY	New York Center identifier
ZOA	Oakland Center identifier

103-109. RESERVED.

APPENDIX 1.

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APPENDIX 2.

ODAPS
IMPLEMENTATION MILESTONES

The following two pages are the most recent Major Implementation Milestones.

ODAPS ACTIVITIES FOR PIP

TE: 16-FEB-1988

DESCRIPTION	ACTUAL FINISH	EARLY FINISH
ITRACT AWARDED (ODAPS PHASE N.P.10/84)	22-OCT-1984	22-OCT-1984
)VISIONING TECH :UMENT/LOGISTICS SUPPORT ANALYSIS	30-NOV-1987	30-NOV-1987
)VISIONING CONFERENCE	2-DEC-1987	2-DEC-1987
ITRACT MODIFICATION AWARDED IASE IIB)	31-DEC-1987	31-DEC-1987
TIATE THE DRR PROCESS	6-JAN-1988	6-JAN-1988
E ACCEPTANCE TEST PLAN APPROVED		16-FEB-1988
R ACCEPTANCE TEST PLAN APPROVED		16-FEB-1988
.INING CONTRACT AWARDED		16-FEB-1988
TORY ACCEPTANCE TEST COMPLETED		26-FEB-1988
JECT IMPLEMENTATION PLAN ROVED		1-MAR-1988
REPORT DELIVERED TO ADL-2		17-MAR-1988
FORM CONTRACTOR INSTALLATION & CKOUT - ZNY HDWR ONLY		29-MAR-1988
R ACCEPTANCE TEST COMPLETE		25-APR-1988
TEM DELIVERED TO FIRST RATIONAL SITE - ZOA		17-MAY-1988
E ACCEPTANCE & INTEGRATION TEST PLETED (IOC)- ZOA		29-JUN-1988
TEM DELIVERED TO LAST RATIONAL SITE - ZNY		22-JUL-1988
INING MATERIALS DELIVERED		26-JUL-1988
RATOR/MAINTENANCE TRAINING INS		27-JUL-1988

ODAPS ACTIVITIES FOR PIP

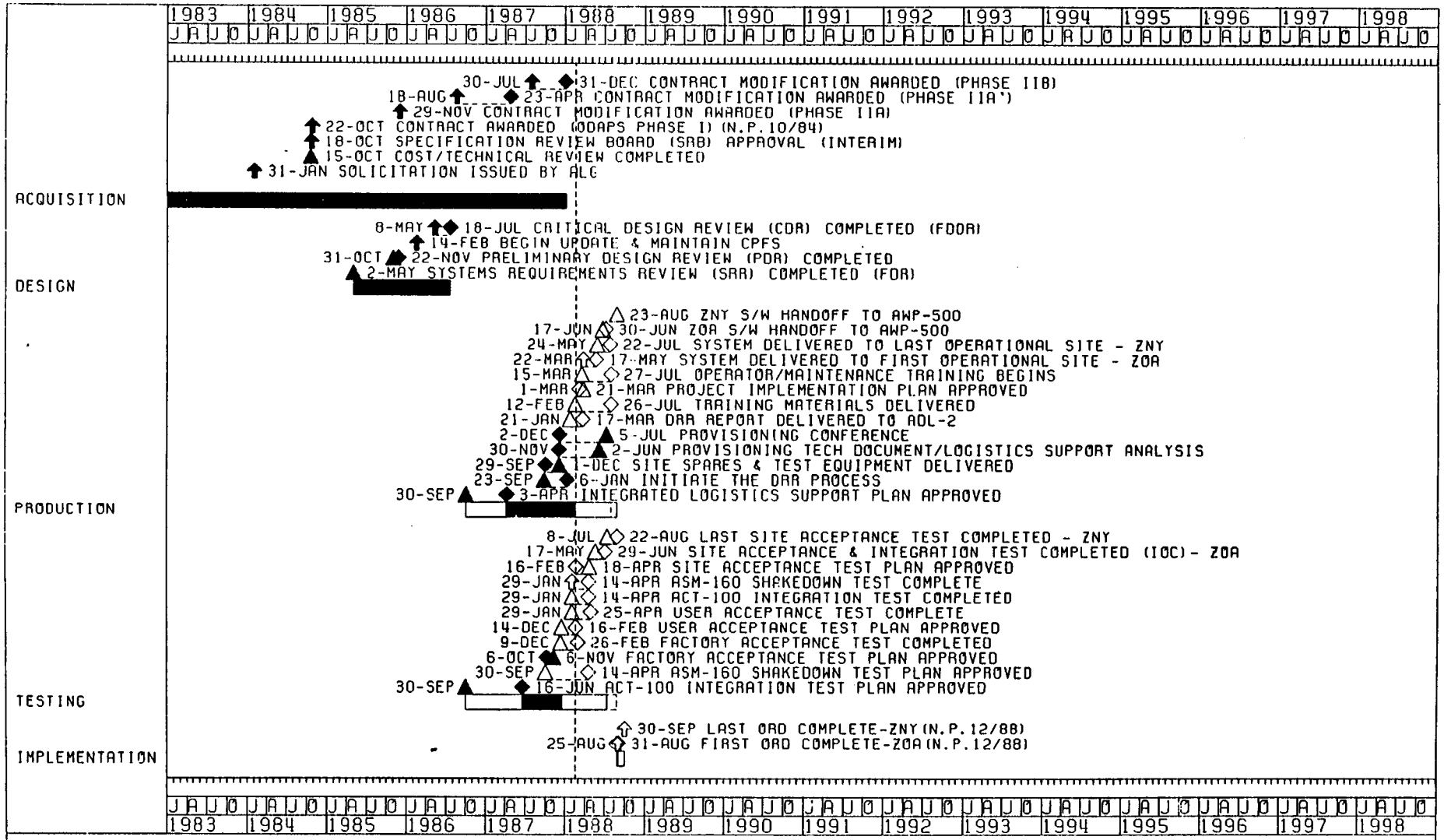
DATE: 16-FEB-1988

DESCRIPTION	ACTUAL FINISH	EARLY FINISH
LAST SITE ACCEPTANCE TEST COMPLETED - ZNY		22-AUG-1988
FIRST ORD COMPLETE-ZOA(N.P.12/88)		25-AUG-1988
LAST ORD COMPLETE-ZNY(N.P.12/88)		30-SEP-1988

APPENDIX 3.

ODAPS
MILESTONE SCHEDULE BAR CHART

The following page is the most recent Milestone Schedule Bar Chart.



SUMMARY MILESTONE SCHEDULE FOR PROJECT: OCEANIC DISPLAY & PLANNING SYSTEM (1-05)

NAS PROGRAM DIRECTOR MILESTONE
SERVICE DIRECTOR MILESTONE
BASELINE.....WORKING DATE
CURRENT WORKING PLAN
BASELINE ACTIVITY
PROGRESS
SHADED MILESTONE INDICATES ACTUAL
(N.P. XX/XX) NAS PLAN DATE

APPROVED BY ..... SEI ..... CLUSTER APPROVAL .....
STATUS DATE: 15-FEB-1988 SCHEDULE BASELINE DATE: 6-JUL-1987
REVISION 29